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ABSTRACT

Using Ohio as a case study, this paper explores what can be learned from state data systems about spending on special education. The analyses and discussion in this paper use data sets for the 1995-96 school year provided by the Ohio Department of Education. The case study examined factors that need to be considered in measuring special education expenditures, the total educational expenditure provided for special education in Ohio, and the costs of serving regular and special education students with a range of educational needs at the elementary and secondary levels. Results from the study indicate a lower marginal cost associated with special expenditures than had been shown in previous literature with the ratio of special education to general costs in Ohio being about 1.5 to 1. For students with more severe disabilities (those receiving specialized services in self-contained settings for 15 or more hours a week), the ratio is around 2.5. For students with mild learning disabilities, the ratio was 1.14 for elementary students, and 1.57 for high school students. The ratio for students served in segregated settings was 3.09. (Contains 18 references.) (CR)

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What Can We Learn from State Data Systems About the Cost of Special Education? A Case Study of Ohio

Jay G. Chambers
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September 1998

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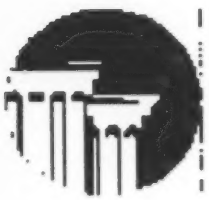

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Preface

This paper explores what we can learn from state data systems about spending on special education. The analyses and discussion in this paper use datasets for the 1995–96 school year, provided by the Ohio Department of Education (ODE). The ODE database was selected for this study because it includes comprehensive accounting, personnel, and student level datasets. In fact, Ohio's database includes substantially more detail than perhaps as many as 80 percent of the remaining states' databases (Chambers, forthcoming 1998).

Specific questions addressed in Part I include:

- What factors must be considered to measure special education expenditures?
- What services should be included in accounting for special education expenditures?
- How are these services categorized?
- How do instructional, administration, and support costs differ?

- How do regular education services figure in determining the costs of serving students with disabilities?

- What kinds of data systems facilitate special education expenditure analyses?

Specific questions addressed in Part II include:

- How much is being spent on educating students with disabilities in Ohio?

- What percent of total educational expenditures is spent providing special education services?

- What categories of expenditures are included in the data?

- How much is spent on instruction, administration and support services, noninstructional services, and other expenditure categories?

- What are the relative costs of providing special versus regular education services?

Specific questions addressed in Part III include:

- What are the costs (per pupil hour? per year?) of serving regular and special education students with a range of educational needs at the elementary and secondary levels and in special needs schools?

- What are the total instructional costs for these different students?
- What are the administrative, support, and other costs associated with educating these students?
- How do the costs of serving regular and special education students compare (i.e., what are the cost ratios between regular and special education?)
- How do the Ohio cost ratios compare with ratios derived from the last national cost study conducted in 1986–87?

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Part I. How Do We Measure the Cost of Providing Special Education Services?

Introduction

Part I of this paper focuses on some of the methodological issues that need to be addressed in conducting a special education expenditure study and describes some of the kinds of data needed to address these issues. Specific questions to be addressed include the following:

- What factors must be considered to measure special education expenditures?
- What services should be included in accounting for special education expenditures?
- How are these services categorized?
- How do instructional, administration, and support costs differ?

- How do regular education services figure in determining the costs of serving students with disabilities?

- What kinds of data systems facilitate special education expenditure analyses?

With these questions in mind, the second section of Part I describes a methodological approach to organizing special education expenditure data. The third section describes the specific elements that must be present in a data system and presents some evidence on the availability of such information in state department of education data systems across the nation. Finally, the fourth section summarizes Part I and suggests implications for future data collections designed to estimate the cost of special education programs.

What Factors must Be Considered in Determining Expenditures on Students with Disabilities?

Before discussing the factors that underlie special education expenditures, several contextual issues should be noted. First, it is important to recognize that students with disabilities represent perhaps the single most diverse group of students served within the public education system in the United States. Students with disabilities exhibit a wide range of physical, cognitive, and emotional needs that public schools must recognize and attend to in designing learning environments. Each student reflects a unique combination of these

three dimensions; and each dimension may require specific curricular, behavioral, and medical adaptations to facilitate learning.

Second, there has been significant pressure to bring children with disabilities back into the mainstream of public education by reducing the segregation in their learning environments — that is, by including these children in the general education classroom to the greatest extent possible. Indeed, the recently reauthorized *Individuals with Disabilities Act* (IDEA) heeds the call from educators and policymakers to reduce fiscal incentives to identify and place children with disabilities in learning environments separate from general education schools and classrooms. Specifically, IDEA now requires that states that distribute funds to local education agencies based on the type of setting in which a child is served must have policies and procedures in place to assure that the state funding provisions do not result in restrictive placements that violate the least restrictive environment provisions of IDEA (Section 612).

Because of this diversity of student needs and placements, a full accounting of spending on students with disabilities must begin with a detailed delineation of the direct instructional services provided to these students. The range of services is broad. In the simplest of cases, students may require only occasional interventions that may be provided easily in the general education environment. Such interventions may involve minor medical treatment administered by a health professional to meet specific physical needs or relatively infrequent therapy to attend to minor speech problems. Other students with disabilities may require adaptations of the general classroom environment to accommodate their special needs. In the more complex cases,

students with severe disabilities may require full-time attention by aides or in special facilities available only in separate public or private school environments.

Providing a full accounting of instructional expenditures requires understanding the complex interrelationship between the specialized services required to meet the diverse needs of students with disabilities and the nature and extent to which these students interact with general education. That is, estimating the marginal costs of special education services requires obtaining information on the full range of services provided to, and received by, individual students with disabilities, regardless of whether those services represent specialized instructional or related services or whether they are the same services received by students without disabilities. In plain language, it means understanding the combinations of special and education services received by individual students with disabilities. It means gathering data on individuals as well as on the institutions or schools that serve them.

A methodological structure for addressing these relationships, developed by Jay Chambers, is referred to as the *Resource Cost Model* (RCM). The RCM is a bottom-up approach to expenditure analysis that uses the service delivery system as the unit of analysis and, to the extent possible, uses direct measures of the physical ingredients of service delivery to measure resources. For example, rather than measuring resources in terms of dollars per se, service delivery systems consist of combinations of personnel time and quantities of nonpersonnel resources like computers whenever possible. Only for relatively inexpensive items (e.g., paper, pencils, or instructional supplies) are dollar

measures used.[1] What follows is a discussion of some of the kinds of delivery systems that are relevant to the development of a database for analysis of special education expenditures.

■ Direct Instructional and Related Services

Regular Instruction

Students with disabilities may receive part of or all direct instructional and related services in the regular environment from self-contained classroom teachers, subject matter specialists who supplement the instruction of a self-contained classroom teacher, or departmentalized classroom teachers. The first two of these service delivery modes are most common at the elementary levels of instruction, while the third is most common at the secondary level. Cost analysis for the individual student requires understanding how much time is spent in each environment, and what kinds of instruction are provided within these types of regular instructional delivery systems.

Special Classes

Students with disabilities may receive direct instructional services in special self-contained or departmentalized classes specifically designed for students with disabilities. At the elementary level, these classes are generally organized

[1] For a more detailed discussion of the RCM and some empirical examples of how this kind of a data system can be used for expenditure and cost analysis, see Chambers (1998a).

in a fashion similar to the regular self-contained classrooms, but they enroll exclusively students with disabilities. These classes are usually smaller in size because of the specialized needs of the student populations being served, and the students spend the majority of their time in these placements. At the secondary level, these special classes are organized around the normal class periods of the school day while other students are taking departmentalized courses. They are generally designed around subject matter specifically targeted for students with disabilities. These classes may focus on academic subjects like English, reading, and math with an adapted curriculum, or they may focus on specific life or work skills necessary for students with particular disabilities or special needs.

Supplemental Resources

In any of these environments, supplemental resources may be provided by the regular education program or any of the special needs programs. Teacher aides may be provided as part of the regular program. Alternative, special needs programs may provide teacher aides — with or without special training — to attend to the needs of students with disabilities, students with limited-English proficiency, or students who are economically or educationally disadvantaged.

Resource Programs

Special education students may receive services from myriad specialists, either within the regular classroom (push-in) or outside of it (pull-out). For example, these specialists may provide direct instruction using curricular materials

designed specifically for certain special need populations or therapy to ameliorate certain physical or mental impairments that may interfere with learning. With the move away from segregated learning environments, the push-in mode of service delivery has become increasingly popular for students with disabilities and students from disadvantaged backgrounds. In contrast to the pull-out mode, in which the child goes outside of the regular classroom to receive services in a separate environment, the push-in mode of service delivery is characterized by the professional educator coming to the child and providing instruction within the regular classroom. This push-in mode of service delivery has also been referred to as inclusion, as it permits the special needs child to be included in the regular education program to a greater extent than the traditional pull-out mode of providing services.

Resource Support Services

In some instances, specialized professionals may provide support services directly to regular classroom teachers, who in turn serve students with disabilities, rather than providing direct services to students per se. For example, resource specialists provide assistance to regular classroom teachers in designing or adapting the curriculum to the specialized needs of students with disabilities being served in the regular program. These kinds of support services are generally not apparent in individual data on student services, but require information about the schools or institutional contexts within which children are served. Only through such institutional data can one ascertain precisely how resource specialists or teachers are used.

External Placements

In some instances, local authorities may seek external placements for the most severely disabled students with very specialized needs. These external placements may be in separate public or private school facilities in which the entire environment is adapted to meet the needs of particular groups of students with disabilities.

School and District Administration and Support Services

Analyzing the costs of special education requires delineating the various school- and district-level administrative and support services that may be required to operate these programs within the context of regular education. Even with no special needs populations, a certain minimum level of administration is required to operate regular education programs at the school and district levels. Some of these general administrative responsibilities include the duties of the district superintendent, the director of fiscal services, the personnel director, and the school principal.

In addition to these general administrative functions are important support functions — particularly, transportation services and capital expenses associated with transportation, special construction needs, and other support services for students with disabilities. Some of these support functions are direct special education expenses, while others can be amortized as a part of special education expenditures over time.

Above and beyond the general administrative and support functions, specific instructional programs generate the need for some administrative and support services. For example, one would expect each full-time teacher to generate the need for some level of program supervision and support. Thus, analysis of expenditures for special education requires collection of data on the specific administrative and support services associated with particular instructional programs.

Per pupil expenditures for program specific administrative and support functions may be higher for special education programs for two reasons. First, staff-pupil ratios among direct instructional staff for special education tend to be higher because special education class sizes and caseloads tend to be smaller. Even if the need for supervision and support per teacher were the same across programs, the expenditures per student for special education program administration and support services would be higher simply due to the higher staff-pupil ratios.

Second, the state and federal regulations that may be associated with programs for special needs populations may require different intensities of administrative and support resources. Typically, these programs are associated with increased reporting, accountability, and regulatory requirements from higher level

government agencies, and these requirements place heavier demands on administrative and support staff to operate these programs.[2]

■ What Kinds of Data Systems Facilitate Expenditure Analyses?

A primary requirement in the development of a database for expenditure analysis in service industries like education is to obtain information on the allocation and use of personnel resources. Personnel resources generally represent the largest single component of service industry budgets. In the case of education, personnel expenditures require 80–85 percent of total school district budgets. Approximately 80 percent is accounted for by employees, while the other 5 percent is accounted for by contracted personnel. The remaining 15 percent is allocated to nonpersonnel expenditures including supplies and materials, books, furnishings and equipment, and miscellaneous services.

[2] Consider the following simple example. Suppose that for every 30 FTE teachers, it is necessary to employ one FTE program administrator or support professional regardless of the specific instructional program. If the staff-pupil ratio in regular education is 1 FTE for every 20 students, then a total of 600 regular students would generate the need for 30 teachers (= 600/20) and 1 regular program administrator or support professional (= total teachers/ratio of teachers per administrator = 30/30). If the staff-pupil ratio in special education is 1 FTE for every 10 students, then a total of 600 special education students would generate the need for 60 teachers (= 600/10) and 2 FTE special education program administrators or support professionals (= 60/30) However, suppose that the actual reporting and administrative requirements associated with each teacher required a greater intensity of services. For example, suppose that 1 FTE special education program administrator or support professional is required for every 20 FTE special education teachers; then, the 600 special education students would generate the need for 60 teachers (i.e., the same as before), but the need for special education program administrators and support professionals would increase to 3 FTEs (= 60/20). This is not to say that this occurs, but rather to raise the possibility that this relationship between administrative and support needs may differ across programs.

Consequently, a key component to organizing an appropriate database for analyzing educational expenditures is a comprehensive list of personnel who provide services. When possible, this list should not be limited to school district employees, since many types of services are provided by professionals who are contracted by the school system or who are employed by other public or private agencies. Moreover, it needs to provide for a fairly detailed list of job assignment codes (e.g., regular class, self-contained class, consultant teacher) so that specific types of staff and staffing responsibilities can be identified.

The remainder of this section discusses the availability of these important data elements in existing state data systems. The first part describes the availability of personnel data systems; the second discusses sources of information on nonpersonnel components; and the third describes the potential for student-level data systems and analysis. The section ends on a cautionary note related to the limitations that existing state data systems have for effectively and accurately estimating special education expenditures.

Sources of Personnel Data

Because most fiscal accounting systems provide little information on actual service delivery and do not link very well to the numbers of students served, other sources of information are needed to build an RCM-type database. There is some reason to believe that state personnel systems may be an important source of cost information about service delivery systems. The quality of these state data systems varies widely, and the personnel data

systems are often not linked to fiscal data systems within the same states. Nonetheless, many states maintain very detailed personnel data systems, which provide valuable

information that may be used to estimate the costs of service delivery within school districts.

According to information on state data systems compiled by CSEF and Westat, Inc., for the Office of Special Education Programs (OSEP), 42 states maintained some type of personnel data systems during the 1991–92 school year (Beller-Simms, 1994).[3] Moreover, 26 of these 42 states include both certified and noncertified school personnel. The potential value of these data systems for cost analysis depends greatly on the detail contained in the assignment coding structure used. In general, the greater the number of assignment codes, the greater the value of the data system for its use in cost analysis.

Table 1 shows the distribution of these state data systems (in 1991–92) according to the number of job assignment codes. Twelve states include over 100 different personnel assignment codes. Typically, these assignment coding structures provide very detailed information on the service delivery systems in which school personnel are employed, and they indicate the amount of time allocated by the individual in each assignment. All of the 42 states that have

[3] The Beller-Simms study examines 49 states, the Bureau of Indian Affairs, Puerto Rico, the District of Columbia, American Samoa, the Northern Marianas, and Palau. For the purposes of this paper, the term state will encompass both states and outlying territories.

such personnel data systems code these personnel assignment data at the level of the school site at which the individual is employed. Of course, without verification, there is no way of knowing how accurately these data reflect the amount of time that an individual spends at each school site. With a few exceptions, these 42 states report information on educational attainments, certification, and job titles for the individual personnel included in the database. Twenty-eight of these states include information on salary levels of individual school personnel.

Table 1. Number of Personnel Job Assignment Codes Used by States and Outlying Areas, 1991–92

Number of Assignment Codes	Number of States and Outlying Areas
5 or fewer	4
6 to 20	13
21 to 50	13
51 to 100	4
over 100	12
TOTAL	**42**

Source: Beller-Simms, (1994).

Finally, 28 of these state personnel data systems report the individual's full-time equivalent (FTE) by assignment, and 21 report the number of students served in each assignment; and it is this information that forms a critical link in

the analysis of costs.[4] These data permit fiscal information to be linked directly to counts of students so that accurate per student costs can be estimated for each type of service delivery system.

A key feature that is often lacking in state personnel data systems is a way to merge the personnel information with fiscal data systems.[5] That is, the individual records on these personnel data systems are not coded in a way that permits the information to be merged or cross-checked against fiscal record keeping systems. Thus, it is difficult, if not impossible, to match cost information estimated from the personnel data system to cost information derived from fiscal record keeping systems. If this linkage between fiscal and personnel systems could be resolved, some extremely valuable information contained in the personnel data systems could be accessed and utilized for fiscal and cost analysis purposes. Moreover, the data derived would be quite consistent with an RCM service delivery system approach.

To summarize, the key features of a personnel data system that would make it ideal for development of an RCM-type of database are as follows:

[4] One FTE equates to one full-time employee. A 0.5 FTE equates to a half-time employee. A number like 2.5 FTEs means two and one-half full-time employees. What constitutes full-time may vary across employers (e.g., school districts) and/or across job titles. For example, what constitutes a full-time teacher may be a 185-day school year for 7 hours per day, while a full-time principal may work 210 days a year for 8 hours per day. Full-time for a district administrator might be 240 work days for 8 hours per day.

[5] Personnel data generally provide better information on job assignments (i.e., indicators of what people do), while fiscal data generally provide better data on benefits and nonpersonnel costs.

Assignment Codes

The system should include a wide range of possible personnel assignment codes indicating the type and context of services being offered and the specific types of children (i.e., the target population) being served. To be sufficient for these purposes, at least 100 assignment codes should probably be included.

Salary and Wage Information

The system should record information on individual salary and wage levels including pay rate for the academic year and extra pay for extra duties performed during the regular school year. These data should be sufficient to determine a consistently defined pay rate for each individual for a fixed interval of time. For example, sufficient information on hourly or annualized FTE pay rates may be needed for the individual where FTE is fully and consistently defined across job categories and school districts. The information typically required includes the job title code, a pay rate per hour or per FTE, total percent of FTE, the total contract hours of work per year for the employee for the school district, and the number of contract days per year.

Location of Service

The system should record the site or building (e.g., school or central office) where services are performed. If an individual works at multiple sites in

multiple assignments, each assignment and each site should be designated in the records for that individual.

Categories of Personnel

All categories of personnel employed by school systems should be included in the file(s). That is, both certified and noncertified school personnel need to be included in the same or similarly constructed files.

Children Served

When appropriate, each assignment of a primary service provider (e.g., a teacher) should be linked to the number of children being served in that assignment (e.g., a class size or caseload). If the assignment is an administrative or support service, then a code should be associated with each assignment indicating the subgroup of children who are being served within the district. For example, a principal serves the total student body within the school to which he or she is assigned. A code could be attached to the record of the principal indicating that this principal serves "all children in the school of location." Standard procedures and categories could easily be assigned to each job assignment category in this type of dataset. Linking children served to personnel assignments provides a mechanism for linking expenditures for service delivery to the actual numbers of children receiving the services.

Personal Characteristics

While not essential, it is often useful to be able to access personal background information, as well as an individual's training and experience, as part of the personnel record. The value of such information is that it may provide ways of standardizing data on pay rates for different kinds of cost analyses that might be done. Basic information that may be useful include total years employed in the district, total years of experience in the current type of position within and outside the current district, highest degree level attained, type of state certification(s) held, race or ethnic origin, gender, and date of birth.

Benefit Information

The system should have some information on the dollar cost of benefits paid on behalf of the individual employee by the school district, the state, or any other agency. These data include the lump sum payments per employee for such benefits as health and welfare insurance along with the payments often made as a percent of salary for retirement or payroll taxes.

As of the 1991–92 school year, four of the 42 states included all of the first six types of information. Eight additional states include items 2 through 5, but do not include as detailed assignment codes or certain specific personal characteristics.[6] No data are available to indicate the extent to which personnel benefit information is included in these state data systems. However, personal experience working with many state data systems suggests that such benefit data would rarely be gathered at the individual level in this fashion. When

[6] The states include Alabama, Colorado, Florida, Idaho, Michigan, Minnesota, Missouri, Montana, North Dakota, Ohio, Texas, and Wisconsin.

studies are done in states without such personnel data systems, it is necessary to develop data collection procedures that essentially create these kinds of personnel data files from existing fiscal, payroll, personnel, and other records available at the school or district level.

■ Nonpersonnel Information

Determining the levels of nonpersonnel resources presents a greater challenge. Few states maintain fiscal systems with accurate school- and/or program-level data on the costs of nonpersonnel resources or services. These nonpersonnel expenditures represent a relatively small percent of school district budgets overall: approximately 15 percent at the district level (Chambers, 1997). If districts are not already coding these nonpersonnel expenditures by program or by school of origin, it is extremely difficult to develop ad hoc mechanisms for attributing these costs to schools and/or instructional programs, much less specific delivery systems. Often, however, the codes that designate the object of expenditure will provide some indication to designate whether a particular item of expenditure should be allocated to the central office or to a school site. In some cases, the codes may even designate the school level (e.g., elementary, middle, high school) to which the expenditure should be attributed, while not indicating the specific school site. In some instances, the program designation (e.g., regular versus special education) may provide some clue as to how these funds might be redistributed.

■ Student Service and Cost Profiles

Student-level data is the final element in developing a complete RCM database. The institutional level cost data that might be constructed using the personnel and nonpersonnel data systems described above provide a solid foundation for conducting analyses of the costs of serving the average student within a given program or school. Indeed, using these types of institutional and service delivery system data can provide the basis for connecting costs with outcomes and conducting cost-effectiveness analyses. However, it is also important and useful to take the next step in this analysis by connecting costs to specific students and, in turn, to the outcomes for these students.

Student service or cost profiles are a means of displaying the diversity of programs being offered throughout a district or school and their costs per pupil. A basic RCM-type database should provide information on the costs per pupil of individual service delivery systems. The student service profile can help organize these data in such a way as to determine the total costs of serving an individual student.

To develop these student cost profiles, the analyst needs to obtain for each individual student a list of the types and intensities of specific direct services received by this student. In addition, data on the programs and schools in which the student is enrolled are required in order to appropriately attach other administrative and support services to individual student records. Using the lists of service delivery systems, the analyst can then merge the individual student data with the information on per pupil costs of individual service delivery systems to estimate costs. These types of data permit the analyst to sort out the underlying factors affecting the costs of serving various specific

categories of students. With these types of student level data, it is possible to compare the costs of serving a regular elementary school student with the costs of serving a student with severe disabilities who may be in a special class, or with a student with milder disabilities who spends most of their time in a regular classroom with the support of a part-time aide and a resource teacher who provide part-time specialized instruction.

The kinds of data required in a student-level database would include the following items:

- student background characteristics
- specific educational need characteristics
- student achievement or other outcome measures (e.g., attendance rate, general program of enrollment, referrals)
- codes for the types and intensities (e.g., hours per week) of direct services, classes, and courses in which the student is enrolled
- the school in which the student is enrolled
- the general program areas in which the student is receiving services

- codes indicating any special services being provided to the student

A few states, including California and Florida, have, in fact, maintained these kinds of individual student databases over the years, and these databases contain some of the required elements described above.[7] Such a data system, combined with good staffing and accounting data, could provide a valuable source of information from which more detailed analyses of the expenditures and costs of serving certain types of students with disabilities may be conducted.

■ Limitations of Existing Data

Despite the potential of some state data systems to provide estimates related to the costs of special education programs, the limitations of current data systems are significant. As discussed earlier, most state fiscal data systems provide little data on actual service delivery and do not link well to the numbers of students served. State-level personnel data systems that can provide this information vary widely in quality and often are not linked to the state's fiscal data systems. Further compromising the quality of state data systems is the absence of accurate school- and/or program-level data on the costs of nonpersonnel resources or services supporting the delivery of special

[7] Although most states maintain a student-level special education database, typical systems contain very limited data indicating disability, type of school attended, birth date, gender, race or ethnicity, and primary placement (Beller-Simms, 1994).

education programs. In addition, few state data systems collect or accurately maintain student-level data, which provide a means for displaying the range of programs offered by a district or school and their per pupil costs. Inconsistencies in the way data are collected by various school districts within a state and incompleteness of the data collected are additional obstacles to the utility of these data. Combined, these limitations create significant barriers to using existing state data systems to provide adequate data needed to produce accurate, reliable estimates of special education expenditures.

Conclusion

Part I of this paper has described some of the sources of information required to conduct expenditure studies for special education services. Good expenditure estimates require a combination of institutional — school- and district-level — data combined with information about the services provided to individual students. The institutional data can provide information about the nature of the service delivery systems (e.g., self-contained, departmentalized, special classes, and resource programs) being offered to various student populations. It can also convey information about the nature of the administrative and support services required to implement direct instructional programs. These kinds of institutional data provide a source for determining how much of the expenditures is allocated to resources designated to serve special education students.

However, such institutional data do not provide sufficient information about how regular and special education services are combined to serve particular categories of students with disabilities. The institutional data do not provide information to ascertain the amount of time students with disabilities spend receiving services in the regular versus special education environments or receiving services from specialized resources (e.g., personnel or equipment). To fill out the picture of the costs of special education services requires information on individual students that designates the amount of time spent by these students in different learning environments and how much of each type of resource they receive in these environments.

The bottom line is that good estimates require a combination of institutional and individual student data to understand the factors that underlie the patterns of resource allocation to special education and to students with disabilities. Expenditures on special education services can be ascertained from institutional data, but ascertaining expenditures required for serving students with disabilities requires a combination of individual and institutional data.

Our experience suggests that relatively few states possess a database with all of the elements needed to conduct a comprehensive analysis of special education spending and the costs of serving different categories of students with disabilities. Many states offer components of the necessary data. For example, states like Ohio, Florida, and Texas have school-based accounting systems that permit detailed estimates of expenditures by instructional program. However, it is often more difficult to separate central level administrative and support expenditures associated with specific instructional programs because

accounting systems are simply not organized by program at the level of district administration.

States such as Ohio, New York, California, Missouri, and Florida provide detailed personnel assignment information that links students served to staff assigned to specific instructional delivery systems (i.e., classes or courses). However, in most instances, only the salaries of individual personnel are reported with no simple way to determine personnel benefit costs. California provides a comprehensive personnel assignment database that is limited to certified school personnel and excludes any data on individual salaries.[8] However, California has recently enhanced its database to include detailed information on the services received by students with disabilities. The state of Illinois has maintained such a data system for more than 2 decades, but has a more limited personnel data system in terms of the assignment categories.

Thus, state-by-state information is quite variable in how well it can be used for conducting analyses of programmatic expenditures and costs. The result is that national studies of expenditures in special education will have to continue to rely on specially designed data collections. These data collections will require large samples of schools and school districts across the country. Such data collections must include comprehensive data on all school staff including those serving regular students as well as students with disabilities. It also must include information on how central office administrative services are organized

[8] When the California Basic Education Data System was established in the early 1980s, individual salary data were collected, but the salary data were dropped at the end of the decade because of concern over reliability of the information. This significantly reduced the value of this database as a tool for analyzing patterns of resource allocation in school programs.

to support programs such as special education. Additionally, the data collection must include information gathered about samples of individual students with disabilities in order to ascertain the extent to which students are served in different learning environments and their exposure to regular versus specialized personnel and nonpersonnel resources. Such data collections are the only way to ensure compatibility within the data collected across states and the only way to ensure that all of the elements necessary for a comprehensive analysis of the patterns of resource allocation to students with special needs are obtained.

Part II. What Do Fiscal Data Systems Tell Us about the Cost of Providing Special Education Services?

Introduction

Part II of this paper reports on an evaluation of the potential for using databases developed by the state departments of education for estimating expenditures and costs of special education services. In doing so, it describes and makes use of the fiscal database to develop estimates of expenditures on special education services. The purpose of the analysis is to see what information is contained in the Ohio Department of Education (ODE) database and how it may be used to address some important questions regarding how much is being spent on special education services — specifically, how do the Ohio data answer these questions:

- How much is being spent on educating students with disabilities in Ohio?
- What percent of total educational expenditures is spent providing special education services?
- What categories of expenditures are included in the data?
- How much is spent on instruction, administration and support services, noninstructional services, and other expenditure categories?
- What are the relative costs of providing special versus regular education services?

The second section of Part II briefly describes ODE's fiscal database; the third section presents results of analysis of the Ohio data on the costs of providing special education services; and the last section summarizes the findings and suggests implications for future data collections designed to estimate the cost of special education programs.

The Fiscal Data in Ohio

The fiscal, or accounting, data in the ODE database are derived from a massive file that contains detailed records of expenditure and revenue transactions for each school and central district office throughout the State of Ohio. According to the Director of Research, many of the elements of this financial database are based on the Coopers and Lybrand model, which has been referred to in the literature as *The Finance Analysis Model (FAM)* or *Insight*.[1] The expenditure transactions, alone, account for more than 1.2 million file records. To the extent possible, all transactions are coded at the school or district level where they occurred. That is, the salaries of personnel are coded according to the school to which they are assigned for service. It is not clear, however, the extent to which there is any consistency across the system in the way that personnel who serve multiple schools are coded.[2] Nevertheless, this coding represents an important accomplishment for the ODE system, since very few states practice coding of fiscal data to the school level.

The ODE accounting system includes a comprehensive set of codes that categorize each fiscal transaction according to the object of expenditure (e.g., salaries, benefits, supplies, and materials) and the function/program (e.g., administration, instruction). The ODE manual for the Education Management Information System (EMIS) includes an array of approximately 200

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[1] See Coopers and Lybrand (1994) for a paper which uses the *FAM* or *Insight* structure to analyze spending in New York City.

[2] It should be noted that the lack of consistent coding of personnel who serve multiple schools may be a problem with both the accounting and Resource Cost Model databases used in the present study.

object codes and 300 function codes.[3] Within the function codes, the ODE database embeds some information about the programs to which the expenditures are devoted. For example, the programs are delineated by levels (elementary, middle, and high school) and by type of child served (gifted, students with disabilities, culturally different, disadvantaged, and adult).

How Much is Being Spent on Special Education in Ohio?

"How much is being spent on special education?" sounds like a relatively straightforward question. Unfortunately, depending on the database used to address the question and precisely how the question is phrased, different answers emerge. Drawing on the ODE fiscal database, Table 2 attempts to address this question. This table presents a summary of the grand total expenditures on all public K–12 education in Ohio in 1995–96. The data in column 2 on grand total expenditures from all funds are divided into six major categories displayed in column 1: instruction, administration and supporting services, operation and noninstructional services, extracurricular activities, capital expenditures, and other uses of funds. Instruction is further broken down into special education and all other education, which includes regular education as well as some vocational education

[3] The ODE EMIS also includes job codes in the fiscal system. However, valid job codes appear in only about 11 percent of the expenditure records contained in the file, and so job codes were excluded from the analysis of the accounting data.

and special instruction for disadvantaged, limited-English proficient students, and other special needs populations identified by the state.

Special education instruction as presented in Table 2 is further broken down by disability condition and by vocational education for special education students. A review of the ODE accounting system suggests that this designation is the only functional or programmatic designation in the system that permits expenditures to be associated with special education. Any further identification of special education related expenditures is based on funds spent from revenues received from federal sources under the *Individuals with Disabilities Act* (IDEA) Part B. Column 3 displays the amount of the grand total expenditures that can be attributed to federal IDEA Part B funding.

Column 4 pulls out only those expenditure items that can be identified by the function or program category codes used by ODE, while column 5 includes any incremental funding of other function categories from federal dollars. Finally, column 6 consolidates those expenditures that can be unambiguously attributed to special education services based on either the function or program category or the federal funding code associated with the expenditure items.

Table 2. **Grand Total Expenditures on All Public K–12 Education and Special Education Services from All Funds and From Federal IDEA Part B Funds for the State of Ohio, 1995–96 School Year**

Function or Program Category (1)	Grand Total Expenditures		Grand Total Special Education Expenditures Based On		Grand Total Special Education Expenditures (6)
	All Funds (2)	Federal IDEA Part B Funds (3)	Function or Program Category (4)	Increment from Federal Part B Funds (5)	
Instruction					
Special Education					
Multihandicapped	$75,320,426	$2,364,145	$75,320,426	—	$75,320,426
Hearing	22,614,320	368,500	22,614,320	—	22,614,320
Visually	4,865,373	68,752	4,865,373	—	4,865,373
Orthopedic/Other Health	19,159,154	176,130	19,159,154	—	19,159,154
Severe Behavior	75,810,987	601,294	75,810,987	—	75,810,987
Developmentally	183,188,023	2,212,971	183,188,023	—	183,188,023
Special Learning Disabled	240,184,838	11,530,802	240,184,838	—	240,184,838
Other Handicaps	50,452,630	2,491,448	50,452,630	—	50,452,630
Vocational education for special education students	12,474,302	0	12,474,302	—	12,474,302
All other instruction	5,402,751,767	1,195,923	—	$1,195,923	1,195,923
Administration and Supporting Services	4,402,775,385	62,607,187	—	62,607,187	62,607,187
Operation of noninstructional Services	539,979,240	283,546	—	283,546	283,546
Extracurricular activities	284,063,597	0	—	0	0
Capital expenditures	1,587,102,830	0	—	0	0
Other uses of funds	567,716,778	3,135,802	—	3,135,802	3,135,802
Total	**$13,468,459,650**	**$87,036,500**	**$684,070,053**	**$67,222,458**	**$751,292,511**
Percent of grand total expenditures (all funds)	100.00%	0.65%	—	—	5.58%
Percent of grand total special education expenditures	—	11.58%	—	—	100.00%
Total Excluding Capital Expenditures	**$11,881,356,820**	**$87,036,500**	**$684,070,053**	**$67,222,458**	**$751,292,511**
Percent of total excluding capital (all funds)	100.00%	0.73%	—	—	6.32%
Percent of total special education expenditures	—	11.58%	—	—	100.00%

Based on these figures, Ohio is currently spending about $11.9 billion, excluding capital expenditures (or $13.5 billion including capital expenditures) from all funds, on K–12 public education. About $684 million is spent on special education instruction (see total in column 4), and about $5.4 billion is spent for all other instruction. Approximately $4.4 billion is allocated for administration and supporting services, $1.6 billion for capital expenditures, $540 million for operation of noninstructional services, $284 million for extracurricular activities, and another $568 million for other uses.

Notice that by using the federal funding to ferret out additional special education spending (see column 3), one can identify more than $751 million being allocated to special education instruction and other special education related expenditures funded by federal dollars (see column 6). This represents about 5.58 percent of overall spending, or 6.32 percent of total spending excluding capital expenditures. Based on these figures, about 11.58 percent of the total spending on special education accounted for in Table 2 is funded by federal Part B revenues.

Does the $751 million represent the total expenditure for educating special education students? The answer is an unambiguous "no!" The reason for this is that the majority of special education students spend a nontrivial portion of their time receiving regular education services. Thus, a substantial portion of the funds allocated to all other instruction can be attributed to the costs associated with serving special education students in the regular education programs.

However, does the $751 million represent the full marginal cost of special education services in Ohio? Not necessarily. The ODE data and coding structure do not

provide an unambiguous answer to this question. For example, notice that the ODE accounting system does not identify through the function or program codes any information on how much is being spent on administration and support services that may be directly attributable to the special education program. However, about $62.6 million of administration and supporting services are funded by federal Part B revenues. This amounts to about 8.3 percent[4] of total special education expenditures that are accounted for in Table 2. Special education instruction accounts for about 91.05 percent[5] of total special education expenditures.

What these data suggest is that all of the administration and supporting services associated with special education are funded by federal Part B revenues. With the available information, there is no way to refute or support this assertion. The question these data cannot answer is whether there are any other expenditures that may be appropriately attributed to the special education programs in the local school districts.

Table 3 uses the information in Table 2, combined with figures on average daily membership, to estimate the expenditures on special education services and their relationship to regular education expenditures. Column 2 displays the total expenditures, excluding expenditures for capital items. Column 3 presents the total expenditures for special education services. Column 4 is the difference between columns 2 and 3, and reflects the total expenditures on regular education, or perhaps more accurately, all non-special education expenditures. Totals appear at the bottom of the table. The percent of expenditures allocated to special versus regular education

[4] 8.3 percent = 100 × $62,607,187/$751,292,511

[5] 91.05 percent = 100 × $684,070,053/$751,292,511

is displayed in the last row, below the total expenditure figures. Average daily membership for Ohio is about 1.76 million children, of whom 200,756 or 11.44 percent are served in special education programs.

Based on this simple analysis, Ohio spends about $6,769 on the average regular education student for all education services. However, this figure may be biased downward because it includes all special education students as if they received the full complement of regular education services. It is likely that special education students spend somewhat less than full time in classrooms receiving regular education services. In fact, some special education students — albeit a small percentage — receive virtually no regular education services at all since they are served in segregated environments. On the other hand, the $6,769 amount may be biased upward because the expenditure figures include resources devoted to other special need populations such as disadvantaged students.

Table 3. Analysis of the Ratio of Special to Regular Education Costs for Public Schools in Ohio, 1995–96

Function or Program Category (1)	Total Expenditures (Excluding capital) (2)	Total Special Education Expenditures (3)	Total Regular Education Expenditures = (col 2) - (col 3) (4)
Instruction			
Special Education	$684,070,053	$684,070,053	$0
All other instruction	5,402,751,767	1,195,923	5,401,555,844
Administration and supporting services	4,402,775,385	62,607,187	4,340,168,198
Operation of noninstructional services	539,979,240	283,546	539,695,694
Extracurricular activities	284,063,597	0	284,063,597
Other uses of funds	567,716,778	3,135,802	564,580,976
Total expenditures	$11,881,356,820	$751,292,511	$11,130,064,309
Percent of total	100.00%	6.32%	93.68%
Total average daily membership served	1,755,228	200,756	1,755,228
Percent of total enrollment	100.00%	11.44%	100.00%
Total expenditure per pupil served	$6,769	$3,742	$6,341
Ratio to regular education expenditures	1.068	0.590	1.000

Table 3 also suggests that Ohio spends about $3,742 on the average special education student. The ratio of special to regular education based on this figure is 0.59, which indicates that Ohio spends an additional 59 percent on special education students than on regular education students. This figure also somewhat overestimates the cost per full-time special education student, since relatively few of these students spend full-time in the special education program.

Nevertheless, these data raise an interesting issue when compared to data from previous studies of special education expenditures. The 59 percent incremental expenditure for special education students implies a ratio of about 1.6 to 1 for the total cost of educating a special education student relative to a regular education student. This ratio is quite a bit below the usually accepted ratio of between 2 and 2.3 to 1, derived by previous researchers (Chaikind, Danielson, and Brauen, 1993). This ratio is also considerably less than the expenditure ratios generated from personnel data from ODE, to be reported in Part III of this paper. Analyses of those personnel data suggest ratios much more similar to those found in earlier research: at the elementary level, about 2.5 to 1 for students with the most severe disabilities and 1.14 for students with mild learning disabilities, and at the high school level, ratios ranging from 1.6 to 2.5.

Three hypotheses that might be considered to explain this difference:

- Ohio's special to regular education expenditure ratio, is and has been, lower than the national average

- Ohio reflects a national trend of reducing the ratio of special to regular education expenditures

- Ohio's accounting data do not accurately reflect the total expenditures on special education services

At present, without more extensive analysis of these data and a more thorough understanding of how local school districts use the coding system within the state, it is not possible to ascertain which of these hypotheses might apply. What the discrepancy in ratios does suggest is that data collection for the purpose of analyzing programmatic costs in education may still have to rely on original data collection by researchers who have developed a compatible method to be applied across states.

Conclusion

Part II of this paper uses the fiscal data from Ohio to examine the patterns of expenditures on special education services as they relate to total expenditures on K–12 education in the state. While the fiscal data system in Ohio makes reference to educational programs in relationship to instructional services, it does not clearly identify the programmatic affiliations of noninstructional services. For example, the extent to which administration and supporting services can be attributed to special education is not clear. While some information is obtained by identifying the fund codes associated with certain expenditures, it is not clear that the expenditures charged to federal Part B IDEA funds account for the total of all noninstructional expenditures generated by special education.

The data presented in this paper show a lower marginal cost associated with special education expenditures (i.e., a lower additional cost of serving students with disabilities) than has been shown in the previous literature. Previous studies indicate a ratio of about 2 – 2.3 to 1 for special education to general costs, while the data from Ohio indicate a ratio of about 1.5 to 1. Further research would be required to ascertain whether this discrepancy indicates that the Ohio analysis does not represent a full accounting of special education expenditures, that the average ratio of special to regular education expenditures has declined, or that Ohio spends less on special education relative to regular education services.

Part III. What Do Student and Staff Course Data Systems Tell Us about the Cost of Special Education Services?

Introduction

In conjunction with Part II of this paper, Part III evaluates the potential for using databases developed by state departments of education for estimating the cost of providing special education services. In doing so, it describes and uses the staff and student course databases maintained by the Ohio Department of Education (ODE) to develop estimates of the costs of serving selected types of students with disabilities. The purpose of the analysis is to see what information is contained in these databases and how it may be used to address some important questions regarding how much is being spent on special education services for students with a range of disabilities — specifically, how do the Ohio data answer questions like:

- What are the costs (per pupil hour? per year?) of serving regular and special education students with a range of educational needs at the elementary and secondary levels and in special needs schools?

- What are the total instructional costs for these different students?
- What are the administrative, support, and other costs associated with educating these students?
- How do the costs of serving regular and special education students compare (i.e., what are the cost ratios between regular and special education)?
- How do the Ohio cost ratios compare with ratios derived from the last national cost study conducted in 1986–87?

The second section of this report briefly describes Ohio's staff and student course data; the third section presents analysis of the Ohio data comparing the cost of special and regular education; and the fourth section summarizes the paper and suggests implications for future data collections designed to estimate the cost of special education programs.

The Staff and Student Course Data in Ohio

The staff and student course data contain staff and aggregated student information [illegible]s to provide a detailed look at how students are served. The staff file includes approximately 250,000 records containing detailed information about individual certified and noncertified school employees, as well as contracted personnel (i.e., individuals who provide services in the schools, but who are not employees of the school system). The file includes information on work time expressed as full-time equivalents (FTEs) and/or hours of work, the level of pay expressed as

an annual dollar amount or an hourly rate of pay, and the position and assignment code of the individual. The personnel coding system includes more than 100 position codes and approximately 150 assignment codes. The position codes designate the type of job (e.g., classroom teacher, principal), while the assignment codes indicate the program or type of students served in that job (e.g., general education, limited-English proficient, Title I, students with disabilities).

The staffing data also indicate the school to which each staff member is assigned. However, as with Ohio's fiscal data system (see Part II of this paper), it is unclear if staff who are assigned to multiple schools are coded consistently. That is, there is no way to determine whether staff who may work in multiple school buildings are coded to each school or are simply coded to the central office.

Presently, the Ohio staffing data track only the salaries of school personnel. They do not currently track data on benefits to individual employees. Therefore, for the tables presented in this report, benefit rates are estimated based on fiscal data on salaries and benefits of certified versus noncertified employees aggregated to the district level.

In addition to the data on individual staff compensation and time, ODE maintains a master course file and a student course file that links staff to students served. The master course file indicates which courses or classes are taught by which teachers and where (i.e., the school site). The student course data link to the master course data and indicate the numbers of students served in each class or course. Linking these data to the individual staff data allows the costs of each class or course to be estimated.

Finally, Part III also makes use of Ohio's fiscal data files to estimate the nonpersonnel costs of instructional services, as well as the costs of school and district level administration and support services. These data are then combined with the instructional costs to provide estimates of the overall costs of serving selected students with disabilities.

■ What is the Cost of Special versus Regular Education?

Using Ohio's staff and student course data, a series of five tables — Tables 4a, 4b, 5a, 5b, and 6 — compares the delivery of instructional services and the cost of special versus regular education in Ohio. Each table contains service profiles of selected types of students. A service profile is a list of the classes or courses in which these kinds of students are likely to be enrolled. In the elementary and high schools, one regular education student has been included among the list for purposes of comparison. Only profiles for students with disabilities are included from the special needs schools since these schools serve primarily special populations of students. In general, all of the profiles selected for this analysis reflect students who are fairly prevalent in the relevant population of special needs students. Using prevalence as a selection criteria increases the confidence that the expenditure figures do not represent unique cases or outliers.

Tables 4a and 5a present the number of hours of service provided by each type of staff/teaching assignment for each service profile; Tables 4b, 5b, and 6 use data on the costs per pupil hour of instructional personnel at each of three types of schools: an elementary school (4b), a high school (5b), and a special needs school for students with disabilities (6).

Column 1 in each table lists the position and assignment of staff and the classes or courses in which one or more of the selected categories of students might be enrolled. Column 2 in tables 4b, 5b, and 6 lists the FTE professional personnel (e.g., teacher or related service provider) required per class hour to provide each class or course. For example, a FTE of 0.125 indicates that a person employed 12.5 percent of full time is required per class hour.[1] Column 3 reports the average class size or caseload for each assigned class or course. Column 4 reports the average cost per pupil hour of class time for instructional personnel. Because the data do not tie teacher aide time to the teachers who may have had aides in their classes, the resulting personnel costs may be underestimated. The absence of teacher aide data is probably most problematic for estimating the costs to serve students with more severe disabilities for whom additional aide time is likely to be required.

[1] Class hours are reported in the ODE database in whole hours per year.

Table 4a. Elementary School Student Profiles for Public Schools in the State of Ohio, 1995–96

School Type *Position and Assignment of Staff*	Sample Third Grade Student Profiles Hours per Year of Service 1. Regular Student	2. Mild SLD	3. Severe SLD	4. Multiple Disabilities	5. Severe Behavior Problems
Elementary Schools **Instructional Services**					
Regular Teaching Assignment					
General Music	72.0	—	72.0	72.0	—
Self-contained: grade 1–8	900.0	792.0	360.0	—	194.4
Specific learning disabled	—	180.0	—	—	—
Special Education Teaching Assignment					
Multihandicapped (Other than deaf-blind)	—	—	—	900	—
Severe behavior handicapped	—	—	—	—	777.6
Specific learning disabled	—	—	540.0	—	—
Total	**972.0**	**972.0**	**972.0**	**972.0**	**972.0**

Student # 1 : Full-time, regular, self-contained classroom of 23 students, general music class of 25 students
Student # 2 : Regular self-contained classroom, resource program, 1 hour per day
Student # 3 : Part-time regular self-contained classroom of 23 students, part-time special class of 7 students, and participates in general music class of 25 students
Student # 4 : Full-time special class of 6 students, participates in general music
Student # 5 : 20 percent in regular self-contained classroom, 80% in special class for 6 students with behavior problems

Table 4b. Elementary School Student Profiles Based on Costs per Pupil Hour for Public Schools in the State of Ohio, 1995–96

School Type *Position and Assignment of Staff*	FTE per Class Hour per Day	Average Class Size or Case-load	Average Cost per Pupil-Hour, Instruc-tion	Sample Third Grade Student Profiles Cost per Year of Service				
				1. Regular Student	2. Mild SLD	3. Severe SLD	4. Multiple Disabil-ities	5. Severe Behavior Problems
Elementary Schools Instructional Services								
Regular Teaching Assignment								
General Music	0.127	24.7	$3.29	$237	—	$237	$237	—
Self-contained: grade 1–8	0.184	22.6	3.48	3,136	2,760	1,254	—	677
Specific learning disabled	0.144	7.7	8.77	—	1,578	—	—	—
Special Education Teaching Assignment								
Multihandicapped (Other than deaf-blind)	0.195	5.8	13.06	—	—	—	11,753	—
Severe behavior handicapped	0.179	5.9	15.01	—	—	—	—	11,675
Specific learning disabled	0.171	7.4	13.16	—	—	7,108	—	—
Total				**$3,373**	**$4,338**	**$8,600**	**$11,991**	**$12,353**

Student # 1 : Full-time, regular, self-contained classroom of 23 students, general music class of 25 students
Student # 2 : Regular self-contained classroom, resource program, 1 hour per day
Student # 3 : Part-time regular self-contained classroom of 23 students, part-time special class of 7 students, and participates in general music class of 25 students
Student # 4 : Full-time special class of 6 students, participates in general music
Student # 5 : 20 percent in regular self-contained classroom, 80% in special class for 6 students with behavior problems

It is assumed that students in the elementary and special needs schools attend class for an average of 5.4 hours per day for 180 days per year.[2] This amounts to a total of 972 hours per year of class time.

■ Elementary School Students

Tables 4a and 4b contain profiles for one regular third grade elementary student and four third grade students with disabilities: a mild specific learning disability, a severe specific learning disability, multiple disabilities, and severe behavior problems. Beginning with the regular elementary student in column 1, the students in the tables are numbered 1 through 5. Table 4a displays the hours per year of service in each of the classes for each of the five types of students. Table 4b displays the cost per year of service, which is derived by multiplying the average cost per pupil-hour in column 4 by the hours of service for each student shown in the corresponding column a. Tables 4a and 4b show the following:

- The annual per pupil cost for instructional personnel totals $3,373 for elementary school student # 1, the regular third-grade student who spends 900 hours in a regular self-contained class of about 23 students and receives 72 hours of instruction in general music in a class of about 25 students.

[2] This estimate of 5.4 hours of attendance is based on the following reasoning. First, the average self-contained classroom is assigned 0.184 FTE per class hour according to the data in Table 3a. Thus, a full-time self-contained teacher spends about 5.4 hours (= 1.0 FTE/0.184 FTE) in class. For the most part, this reflects the length of a school day for elementary students.

- Elementary school student # 2, who has mild specific learning disabilities (SLD), spends most of their time (792 hours per year) in the regular self-contained classroom, but also receives specialized instruction by a resource teacher for 5 days per week, 1 hour per day. The annual cost for instructional personnel is $4,338.

- Elementary school student # 3, diagnosed with more severe specific learning disabilities, spends about 40 percent of the day receiving instruction in a regular self-contained classroom of about 23 students and 72 hours of instruction in general music in a class of about 25; however, the remainder of this student's time is spent in a special class of about 7 students designed for more severe SLD cases. The total cost for this student is $8,600, or about double the mild SLD student, and about 2.5 times what the regular student costs.

- Elementary school student # 4, who has multiple disabilities, receives full-time instruction in a special class of about 6 students, but does share some time receiving instruction in general music with regular students. Total expenditures for instructional personnel for this student are $11,753, or about 3.5 times what is spent on the regular elementary student # 1.

- Elementary student # 5, who has severe behavior problems, spends 80 percent of the day in a special class of 6 students and only 20 percent of the day in a regular classroom. Annual instructional

personnel costs for this student are $12,353 — about 3.7 times the cost for student # 1.

■ High School Students

Tables 5a and 5b display service profiles for four high school students: one regular lower division (freshman-sophomore) student and three students with disabilities: a mild SLD, a severe SLD, and severe disabilities not classified by disability condition.[3] High school students are assumed to take six class periods of instruction per day at approximately one per period (including passing time between classes). As shown in Tables 5a and 5b:

- The lower division student # 1 takes five full-year classes (180 hours per year) and two one-semester classes (90 hours per year each). The five full-year classes include advanced placement (AP) English, Spanish, physical education, algebra, and earth science. The two one-semester classes include geography and current events/issues. All of the regular classes range in size from a low of about 18 for the AP English class to a high of almost 23 students for geography and physical education. Total expenditure for instructional personnel for this student amounts to $4,805.

- High school student # 2 is a mild SLD student who takes three regular full-year classes (180 hours per year) including physical education, general mathematics, and earth science, and also takes

[3] Although the student data file designates this student as having severe disabilities, the personnel data do not identify disability.

two regular one-semester classes (90 hours per year). The other two periods per day include a visual arts class and two one-semester classes in remedial reading and grammar and usage. These last two classes are designed for students with disabilities and are taught by employees with the job title of special education teacher. Class sizes tend to be lower for all of the special education classes (i.e., those designated as a special education teaching assignment in Tables 4a and 4b). They range from a low of 3.5 for remedial reading to a high of 9.7 for visual arts. The total annual expenditure for this student is $6,294, or about 1.3 times the expenditure for the regular lower division high school student.

- High school student # 3 has a severe SLD and spends half the day in a class designed specifically for SLD students with an average class size of 4.8 students. During the other half day, this student takes physical education, general mathematics, and geography and current events with the regular students. The total expenditure for this student is $8,095, or about 1.7 times that of the regular lower division high school student.

- High school student # 4 is not classified with a disability, but has sufficiently severe impairments to receive all instruction in very small classes taught by a special education teacher. The total expenditure for this student is estimated to be $11,532, or about 2.4 times the expenditure for the regular high school student # 1.

Table 5a. High School Student Profiles for Public Schools in the State of Ohio, 1995–96

School type *Position and Assignment of Staff*	Sample High School Student Profiles Hours per Year of Service 1. Regular Lower Division	2. Mild SLD	3. Severe SLD	4. Severe Disability
High Schools				
Instructional Services				
Regular Teaching Assignment				
AP English	180.0	—	—	—
Spanish	180.0	—	—	—
Physical Education	180.0	180.0	180.0	—
Algebra	180.0	—	—	—
General Mathematics	—	180.0	180.0	—
Earth Science	180.0	180.0	—	—
Geography	90.0	90.0	90.0	—
Current Events/Issues	90.0	90.0	90.0	—
Special Education Teaching Assignment				
Visual Art	—	180.0	—	180.0
Integrated Language Arts	—	—	—	180.0
Remedial Reading	—	90.0	—	—
Grammar and Usage	—	90.0	—	—
Reading	—	—	—	180.0
Physical Education	—	—	—	180.0
Applied Mathematics	—	—	—	180.0
Geography	—	—	—	90.0
Current Events/Issues	—	—	—	90.0
Specific Learning Disabled	—	—	540.0	—
Total	1080.0	1080.0	1080.0	1080.0

Student # 1 : Regular college program
Student # 2 : 4 regular courses plus special reading and math
Student # 3 : Half day regular program, half day special classroom
Student # 4 : All day special program

Table 5b. **High School Student Profiles Based on Costs per Pupil Hour for Public Schools in the State of Ohio, 1995–96**

School Type *Position and Assignment of Staff*	FTE per Class Hour per Day	Average Class Size, or Case-load	Average Cost per Pupil-hour, Instruction	Sample High School Student Profiles Cost per Year of Service			
				1. Regular Lower Division	2. Mild SLD	3. Severe SLD	4. Severe Disability
High Schools							
Instructional Services							
Regular Teaching Assignment							
AP English	0.224	17.8	$5.26	$946.61	—	—	—
Spanish	0.201	20.3	4.53	814.66	—	—	—
Physical Education	0.193	22.6	4.69	844.06	844.06	—	—
Algebra	0.209	21.8	4.18	752.29	—	—	—
General Mathematics	0.209	18.4	4.51	—	812.29	—	—
Earth Science	0.221	22.5	3.96	712.82	712.82	—	—
Geography	0.203	22.6	3.50	315.03	315.03	315.03	—
Current Events/Issues	0.213	19.3	4.67	419.88	419.88	419.88	—
Special Education Teaching Assignment							
Visual Art	0.183	9.7	6.73	—	1,210.50	—	$1,210.50
Integrated Language Arts	0.101	4.3	12.25	—		—	2,205.36
Remedial Reading	0.101	3.5	11.40	—	1,025.57	—	—
Grammar and Usage	0.131	4.2	10.59	—	953.54	—	—
Reading	0.132	4.8	15.87	—	—	—	2,856.74
Physical Education	0.097	4.2	13.44	—	—	—	2,420.07
Applied Mathematics	0.191	5.5	10.80	—	—	—	1,944.18
Geography	0.122	6.1	9.94	—	—	—	894.93
Current Events/Issues	0.073	3.7	6.21	—	—	—	559.13
Specific Learning Disabled	0.145	4.8	13.63	—	—	7,360.19	—
Total				**$4,805**	**$6,294**	**$8,095**	**$11,532**

Student # 1 : Regular college program
Student # 2 : 4 regular courses plus special reading & math
Student # 3 : Half day regular program, half day special classroom
Student # 4 : All day special program

■ Students Served in Special Needs Schools

Table 6 displays two student profiles: one for a student with severe behavior problems and one for a student with severe orthopedic impairment. Each of these students receives services full-time in a self-contained class within a special school, and each receives supplemental services from other related services providers who provide specialized services for students with the specific diagnosed disability. The annual expenditures for instructional personnel for special needs students # 1 and # 2 are $13,225 and $19,813, respectively.

Table 6. Special Needs School Student Profiles Based on Costs per Pupil Hour for Public Schools in the State of Ohio, 1995–96

School type *Position and Assignment of staff*	FTE per Class Hour per Day	Average Class Size or Caseload	Average Cost per Pupil-hour, Instruction	Sample Third Grade Student Profiles			
				1. Regular Third Grade Severe Behavior Problem		2. Third Grade Student, Severe Orthopedic Impairment	
				Hours per Year of Service	Cost per Year of Service	Hours per Year of Service	Cost per Year of Service
Special Education Schools Instructional Services							
Special Education Teaching Assignment							
Severe Behavior Handicapped	0.126	4	$8.95	900.0	$8,051.67	—	—
Orthopedically Handicapped	0.199	5	23.06	—	—	792.0	$18,266.50
Other Education Support Services	—	—	—	—	—	—	—
Other Professional - Educational	—	—	—	—	—	—	—
Severe Behavior Handicapped	0.357	2	71.85	72.0	5,173.19	—	—
Related Services	—	—	—	—	—	—	—
Orthopedically Handicapped	0.159	5	8.59			180.0	1,546.66
Total				972.0	$13,225	972.0	$19,813

Student # 1 : Full-time special class, supplemental services, other professional
Student # 2 : Full-time special class and related service

■ Ratio of Special to Regular Education Costs for Selected Students

Table 6 combines the information in the previous 5 tables on instructional personnel costs with information from the ODE fiscal data files on nonpersonnel components of instruction and all administration and support costs at the school and district level. Column 1 provides a description of the student and column 2 provides an overview of the placements for each student. Column 3 displays the total expenditures per pupil on professional school personnel (e.g., teachers and related service providers).

Column 4 provides an estimate of the nonpersonnel expenditures associated with each category of student. These estimates are based on the nonpersonnel expenditures associated with instruction and are derived from the fiscal data for each of the levels of education or categories of students as identified in the ODE fiscal data files described in Part II of this paper.

Columns 5 and 6 — also based on ODE fiscal data files — display expenditures for administration, support, operations, and related costs at the school and central district office levels for elementary, high, and special needs schools. For example, the average expenditures for elementary, high, and special needs school level administration and support (column 5) are $801, $1,412, and $3,351, respectively. District level administrative and support expenditures per pupil (column 6) are $1,697.

Total expenditures per pupil appear in column 8, and the ratios of per pupil expenditures for each student profile to regular education expenditures for an elementary school student are in column 9. At the elementary level, these

expenditure ratios range from 1.14 to 1 for a mild SLD student to 2.49 to 1 for a student with severe behavior problems served in the elementary school. Notice that the cost of serving a regular lower division high school student has a ratio of 1.37 to 1 relative to the regular elementary student. This results from somewhat smaller class sizes and longer school days at the high school relative to the elementary school. The high school ratios for the selected students with disabilities range from 1.57 – 2.48 to 1. Not surprisingly, the sample student profiles in special needs schools show even higher expenditure ratios. The student with severe behavior problems shows an expenditure ratio of 3.09 to 1, while the student with a severe orthopedic impairment shows an expenditure ratio of 4.26 to 1.

Table 7. **Comparison of per Pupil Expenditures for Selected Students with Disabilities and Regular Education Students (Comparisons based on 1995–96 data from the Ohio Department of Education)**

School Level Student Description	Instructional Cost per Student and Other Related Costs*		Administration, Support, Operations		Total Cost per Pupil	Ratio to Regular Elementary
	Personnel	Non-personnel	School Level	District Level		
Elementary School						
# 1 Regular third grade	$3,373	$173	$801	$1,697	$6,044	1.00
# 2 Mild specific learning	4,338	43	801	1,697	6,879	1.14
# 3 Severe specific learning	8,600	86	801	1,697	11,184	1.85
# 4 Multiple disabilities	11,991	296	801	1,697	14,785	2.45
# 5 Severe behavior problems	12,353	217	801	1,697	15,068	2.49
High School						
# 1 Regular lower division HS	4,805	338	1,412	1,697	8,253	1.37
# 2 Mild specific learning	6,294	113	1,412	1,697	9,516	1.57
# 3 Severe specific learning	8,095	146	1,412	1,697	11,350	1.88
# 4 Severe disability	11,532	324	1,412	1,697	14,964	2.48
Special Needs School						
# 1 Severe behavior problem	13,225	424	3,351	1,697	18,697	3.09
# 2 Severe orthopedic	19,813	890	3,351	1,697	25,751	4.26

Table Notes

*These figures are derived from Table 2 of Chambers (1998) and reflect information derived from the ODE financial database. Figures for school level administration and support services are derived from data at each of the respective levels: that is, figures are based on the schools attended by the average elementary, high school, and special needs student, respectively. The school and district level costs include administration and supporting costs, operations of non-instructional services, extra curricular activities, and other uses of funds. Capital expenditures are excluded as these data are not broken out properly by school level or type.

Elementary School
1 Regular self-contained class and general music
2 Regular self-contained class and resource room
3 40 percent regular self-contained, 60 percent special class, and general music
4 F/T special class with participation in general music
5 40percent regular self-contained, 60 percent special class, and general music

High School
1 Regular college preparation program
2 Four periods regular class and special reading and math
3 Half day regular program, half day special program
4 All day special classes and courses

Special Needs School
1 Full-time special class and supplemental professional services
2 Full-time special class and related services

As mentioned earlier in this report, these ratios are based on data for the 1995–96 school year for public schools in Ohio. Table 8 compares these Ohio cost data and expenditure ratios between special and general education with the cost data and ratios derived from the last national study of special education expenditures conducted in 1986–87 (Moore et al., 1988). As the table footnotes indicate, the categories of students in the two studies are somewhat different, and the earlier study does not differentiate between elementary and high school students. Despite these differences, there are some similarities between the cost ratios for elementary and high school students derived from both studies:

- The ratios for students with more severe disabilities (those receiving specialized services in self-contained settings for 15 or more hours a week) are virtually identical for the most severely disabled students in both studies — around 2.5.

- The ratios for Ohio students with mild SLD, which were 1.14 for elementary students and 1.57 for high school students, are somewhat comparable to the ratio of 1.9 for resource program students in the earlier study.

- The ratios for students served in comparable segregated settings in both studies are very similar: the ratio for students in special needs schools in Ohio is 3.09, while the ratio for students served in self-contained classrooms in private schools in the Moore study is 3.3.

Table 8. A Comparison of the Cost Data from the Ohio Database, 1995–96 and the Last National Cost Study, 1986–87

Categories of Students	Ohio Data 1995–96		Moore Data[1] 1986–87		
	Cost	Ratio	Cost	Ratio	Program Type
Elementary School					
# 1 Regular third grade student	$6,044	1.00	$2,780	1.0[2]	—
# 2 Mild specific learning disabilities	6,879	1.14	5,243	1.9	Resource[3]
# 3 Severe Specific learning disabilities	11,184	1.85	—	—	—
# 4 Multiple disabilities	14,785	2.45	6,913	2.5	Self-contained[4]
# 5 Severe behavior problems	15,068	2.49	—	—	—
High School					
# 1 Regular lower division HS student	8,253	1.37	2,780	1.0	—
# 2 Mild specific learning disabilities	9,516	1.57	5,243	1.9	Resource[3]
# 3 Severe Specific learning disabilities	11,350	1.88	—	—	—
# 4 Severe disability	14,967	2.48	6,913	2.5	Self-contained[4]
Special Needs School					
# 1 Severe behavior problem	18,697	3.09	9,267	3.3	Private[5]
# 2 Severe orthopedic impairment	25,751	—	—	—	—

[1]These data are extracted from Tables 4.1 and 4.3 (Moore et al., 1988). It is important to note that these data do not differentiate between elementary and high school expenditures; thus, the same data are used for purposes of comparison with the Ohio elementary and high school data.
[2]This represents the nationwide average per pupil expenditure for regular education during the 1985–86 school year. This expenditure encompasses both academic instruction in reading, mathematics and science, as well as supplemental instruction in music, art, and the like, and covers elementary and secondary students (Moore et al., 1988, p. 98). The basis for the Ohio ratios includes only elementary students.
[3]The Moore data for students served in resource programs reflect those students, age 6–21, who receive specialized services for less than 15 hours per week (in regular classrooms and resource rooms). These data are used for comparison with Ohio data on elementary and high school students with mild SLD who are primarily served in regular classrooms, but receive specialized instruction from a resource teacher for about 5 hours per week.
[4]The Moore data for students served in self-contained programs reflect those students, age 6–21, who receive specialized services for 15 or more hours per week (in regular schools and special day schools). These data are used for comparison with Ohio data on elementary and high school students with several types of more severe disabilities, who are primarily served in separate classrooms, but receive some regular instruction.
[5]The Moore data for students served in self-contained, private school programs reflect those students, age 3–21, who receive services in private special education day school programs. These data are used for comparison with Ohio data on students with a severe behavior or orthopedic problem, who attend a separate special needs school.

Conclusion

Staff and student course data of the kind available in Ohio can be used to develop some understanding of the sources of variation in per pupil expenditures for different categories of special education students. The categories selected for the sample student profiles used in this report reflect a relatively high incidence of classes and courses in the ODE student course database. Moreover, the category of SLD students accounts nationwide for just over half of all students with disabilities — 51.2 percent in 1995–96 (U.S. Department of Education, 1997).

To develop these student profiles, it would have been preferable to have data showing the actual patterns of enrollment of specific students. While such data do exist in Ohio, they are maintained by local service centers throughout the state and are not available to the state department of education. To obtain such individual student data would require permission of the individual districts from which the data are collected. What the state does have and what has been used for this study is a database that has been aggregated to the course level within a school. Thus, the Ohio data indicate every single course or class by location within a school building and are coded to link to the individuals assigned to teach the class. The data also indicate the total enrollment of each class. The data do not, however, permit following a student from class to class. The profiles developed in this report are, therefore, examples of combinations of classes and courses in which particular types of students might be expected to be enrolled.

Relatively few states besides Ohio have similar student-level data available.[4] There are a few notable exceptions. California, for example, has recently developed a

[4] Although most states maintain a student-level special education database, typical systems contain limited data on disability, type of school attended, birth date, gender, race or ethnicity, and primary placement (Beller-Simms, 1994).

student-level database that contains detailed information about the kinds of services students with disabilities are receiving, and Illinois has had a similar student-level database for more than 20 years. Florida also maintains a relatively detailed student-level database that accounts for services received by all students.

In addition, a number of states have relatively detailed class and course assignment data, which makes it possible to determine FTE personnel time and class sizes. Some of the states with excellent personnel assignment databases of this kind include New York, Missouri, Texas, Florida, and California. However, the California database has eliminated salary information from its assignment-level database, substantially reducing the value of the database for producing the kind of expenditure analysis presented in this report.

Unfortunately, these databases do not appear to successfully connect certified with noncertified instructional school personnel. That is, it is difficult to ascertain from the data whether particular classes have any aide time attached to them. Thus, while the professional personnel costs of a given class can be captured, it is difficult to determine the extent to which different classes might or might not include aides.

Another limitation of the analysis presented in Part III is the inability of Ohio's fiscal data to distinguish between administration and supporting services for different categories of students.[5] To fully account for the differences in expenditures for serving regular students and students with disabilities, it is necessary to consider the potential difference in the intensity of administrative and supporting resources required for each of these programs. In fact, one might expect that government regulations, as reflected in IDEA Part B, regarding

[5] Refer to Part II for an illustration of one approach to estimating how much of administration and supporting expenditures can be associated with special education.

implementation of special education programs would result in higher intensities of administrative and support resources associated with serving students with disabilities. If this is true, the student profiles presented in this report would tend to underestimate the difference in expenditures between regular and special education, since the data do not differentiate the administrative and supporting requirements for different categories of students.

The technique of developing student profiles presented here suggests that future analyses of expenditures on individual student differences could benefit significantly from more detailed and accurate information on the actual profiles of services received by individual students.[6]

[6] For an empirical example of how such data might be used, see Chambers (forthcoming 1998).

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